www.extron.com

ExtroNews™

Issue 14.1 January – March 2003

FEATURE ARTICLE

On the cover...
Building a Smarter System Through Ethernet: Introducing the IPL T S2

COLUMNS

4 **Andrew Online**
Union of Extron and Inline Going Well

6 **Technically Speaking...**
SDI Through Analog Video Distribution Equipment: A Good Idea?

14 **Troubleshooting Tips**
Eliminate Your Sync Problems, Part II

16 **Tech Corner**
The Extron MLC 206 Emulation Software

ALSO IN THIS ISSUE

10 New Products

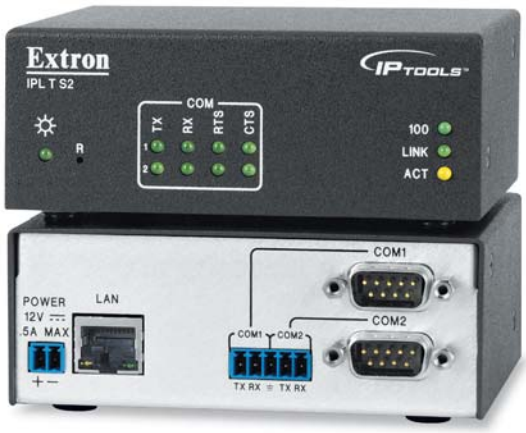
13 Extron New Product Showcase and Cocktail Reception at the Venetian, Las Vegas

18 New News

20 Tweeker Use

*Be sure to fill out and return the 2002 **ExtroNews Annual Survey Card** included with this issue. You could win a VTG 200!*

Building a Smarter System Through Ethernet: Introducing the IPL T S2



Extron IPL T S2 Ethernet-to-serial interface

In a school of 20 classrooms, each has a projector, computer, VCR, and switcher. In one classroom, a teacher's lesson ends abruptly when the projector's bulb fizzles. In another, several students are disappointed when they discover they can't view a scheduled video because the projector is missing. In the administrative office, the monthly bill shows a jump in electricity use, and the maintenance crew is ordered to spend the last 30 minutes of the day powering down all classroom equipment.

What's wrong with this picture? Not only is valuable learning time disrupted and lost, but the teachers must spend time troubleshooting equipment needs they may not be trained to examine. In addition, the maintenance crew's time traversing from room to room could be better spent on more pressing school needs.

Management of such an environment has just gotten easier. The solution is the Extron **IPL T S2**, a new and compact Ethernet-to-serial interface that allows technicians to access, monitor, and troubleshoot A/V equipment remotely. The IPL T S2 enables users to connect any powered Extron or third-party A/V product with a serial control port to a LAN, WAN, or the Internet, providing all the benefits of Ethernet control. This simplifies the operation and administration of any

continued on page 2

Introducing the IPL T S2 (cont.)

attached serial device, including projectors, cameras, and displays.

A Better Way

Ultimately, the IPL T S2 allows A/V professionals to build smarter systems. It's an inexpensive way to reduce equipment downtime, lower maintenance costs through preventive service, and help manage devices via a corporate LAN or the Internet. A/V professionals and their customers benefit by having more flexibility and upgradeability, even over long distances.

So, in the example above, a technician can access, monitor, and troubleshoot the school's A/V equipment from one location on campus. Via a Web browser, the technician can program the IPL T S2 to track the projector's lamp life and generate an e-mail alert at 1800 hours, well before its life maximum of 2000 hours. The e-mail alert can be received by a computer, cell phone, PDA, or pager. The technician can then order and replace the new lamp before the existing one burns out. In addition, all systems can be scheduled to power on or off at pre-determined times, and each device can be automatically monitored for its connection to the LAN. As a result, equipment is proactively serviced and downtime is minimized, a technician knows the status of all devices at any time, utility expenses are reduced, and the end-user is highly satisfied. Most importantly, this end-user can focus on their core competency: education.

Web Server and Customizable Web Pages

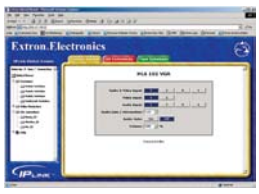
The Extron IPL T S2 is part of a growing family of IP Tools™, a new series of products that provides remote monitoring, control, maintenance, and status of A/V devices through Ethernet. The IPL T S2 uses Extron's exclusive IP Link™ technology, which is specifically engineered to meet the needs of professional A/V environments. IP Link technology enables serially controlled (RS-232/422/485) products to be connected to Ethernet, and it has already been built into many Extron products, including the Matrix 12800, the ISS series of seamless switchers, CrossPoint Plus, and the ISM series of matrix switchers.

The IPL T S2 contains an integrated, high-performance Web server with 1.5 MB of Flash memory for storing HTML files, JavaScript, Flash animation, and graphics. Customizable Web pages can be created and stored using off-the-shelf programs, such as Macromedia Dreamweaver or Microsoft® FrontPage. A/V professionals can populate the pages with their own brand name, logo, and marketing message, and design how the alert data can be displayed, such as a bar graph, pie chart, or colored on/off buttons. Customizing allows A/V design and integration firms to differentiate themselves from the competition – they're not confined to a standard look and feel.

IP Link Configuration Software

The IPL T S2 ships with Windows®-based configuration utility software. The software allows you to identify which A/V products are connected to each IPL T S2 in the system. The user can then configure these products for control through the IP Link Global Viewer interface. Drivers for a variety of projectors and a number of Extron A/V products will be available for download from the Extron Web site (www.extron.com).

IP Link Global Viewer Software



Once the products are identified and configured, the user can view the entire A/V system status via a Web browser using the supplied Global Viewer™ Software. Each Ethernet-enabled product will have a unique IP address with links tied in through the Global Viewer device list on the left hand side of the screen. The user simply clicks on an icon representing the chosen device in the system. The following three tabs enable the user to access, control, and monitor the A/V equipment connected to the IPL T S2:

- ***Control*** – Within a simulated interface, the user is able to view and manipulate such basic functions as volume, mute, video inputs, power, and more.

- ***Monitor*** – The user can view all the status functions of a product and configure alerts as needed. Or, the user can poll the lamp hours of a connected projector at regular intervals. When lamp hours reach a pre-determined number, the IPL T S2 sends a message via e-mail to the user indicating the lamp needs to be replaced.

- ***Schedule*** – The user can set up schedules for troubleshooting and monitoring. For example, a user can schedule the power to shut off at a specific time.

Proactive Service and Security

Proactive service, support, and preventive maintenance are also possible with the IPL T S2. For secure installations that do not allow Internet access, online monitoring can still be performed using the Global Viewer. Within an existing, secure LAN infrastructure, e-mail notification of failures and repairs is possible without compromising the security of the A/V system and facility.

A/V professionals and their customers can also be assured the product is secure on a network. Security is incorporated in two levels of password protection: limited access and complete access. Limited access allows users to control only pre-designated functions, while complete access gives administrators full functionality. For additional security, the products may be placed behind a firewall.

Easy Setup

The two bi-directional serial ports on the IPL T S2 can be used as direct connections to control two independent devices simultaneously or as pass-through connections within a system. Housed in a small and rugged quarter rack, 1U high enclosure, the IPL T S2 is easy to integrate into existing and new A/V systems, and can be mounted alongside Extron VersaTools™ products. Its versatile mounting options also allow it to be mounted under a desk or on a projector.

Additional Features

- **High-performance architecture:** Web pages are served up to 50 times faster (6 Mbit/sec transfer rate) than similar products, so data is refreshed at a consistent high speed.

- **Power options:** For added flexibility, users are able to power up the IPL T S2 two different ways. With the power over Ethernet feature, there is no need for a local power supply. The included 100-240VAC, 50/60Hz, autoswitchable, external desktop power supply provides worldwide power compatibility (requires compatible connected equipment).

- **Proactive troubleshooting and service:** Program operating alerts, sequencing and automatic monitoring. For example, technicians can program the IPL T S2 to periodically poll the device to verify a working connection, and automatically send an e-mail to technical or security personnel if the device is disconnected.

- **Customizable Look and Feel:** 1.5 MB of Flash is included for storing user-customized Web pages in HTML, Javascript, Flash, graphics, and more.

- **Easy command input:** Terminal emulation mode allows for the input of RS-232 commands to the controlled device using the Extron Simple Instruction Set (SIS™), a set of simple ASCII commands developed by Extron that allow easy control of Extron products.

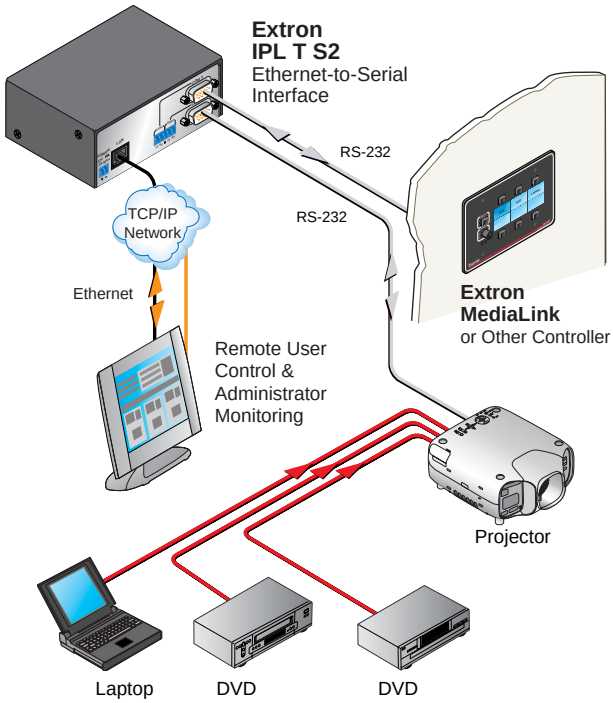
- **Centralized Management:** Communicate with the device using any standard Web browser and other standard protocols, such as Telnet, ICMP, and DHCP. Because of its ease of use, end-users won't require training on new or proprietary technology.

- **Extron Product Support:** Adapt the IPL T S2 to work with legacy Extron products by downloading pre-configured Web pages from the Extron Web site (www.extron.com). These will be available first for all CrossPoint products, and support for others will follow.

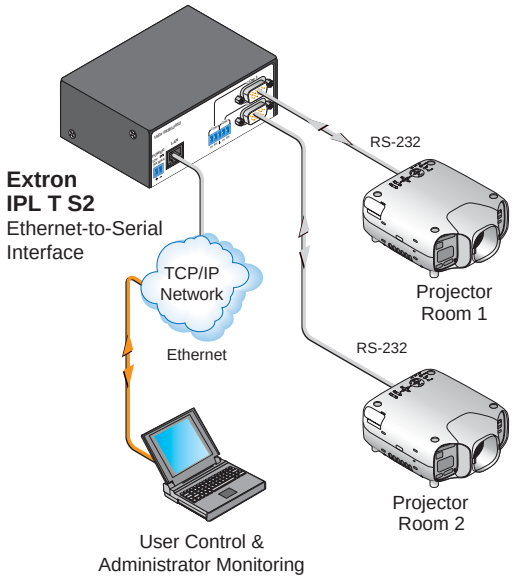
- **Network Upgradeable Firmware:** As upgrades to the IPL T S2 are developed, they can be downloaded with the latest features from the Extron Web site (www.extron.com).

For more information on the IPL T S2, contact your Extron Customer Support Representative at 800.633.9876.

Pass-Through Mode



Two-Device Control



by Andrew Edwards, President of Extron Electronics

Progress Report:
Union of Extron and Inline Going Well

Since our announcement in August of the combination of Extron and Inline, the support staffs from both teams have been working overtime to learn both product lines. I was talking with our applications engineers recently, and although they were overwhelmed at first, the similarities of the two product lines have helped them come up to speed quickly. Now, there is a feeling that all product is Extron product and all support is Extron support. I would like to give you an update on some past events and what you can expect in the near future as we continue to work through this process.

Invoicing and Billing

A major challenge for us was to get the invoicing and billing for both product lines into one system. I am pleased to note that as of November 1st, the Extron software system was ready to support all Inline product. Billing for Inline and Extron on the same invoice has been working well with only a few minor issues. In the first few days, there were a few shipping delays due to the relocation of the Inline manufacturing, shipping, and inventory systems to the Extron facility. However, product is moving smoothly now. If you are experiencing a particular difficulty, or you have concerns that need my attention, please contact me personally.

Inline Web Site

On August 16, the Inline Web site was fully linked and accessible from the Extron home page. Currently, our Web development group is transferring all Inline product to the Extron Web site. We expect product updates to occur weekly until all product is posted. In addition to material provided by Inline, we will add more information about Inline products to be consistent with the content found for Extron product. Available online will be specifications, catalog pages, application diagrams, panel drawings, software and drivers, user manuals, and other product information. Look for many more additions to our Web site in the near future.

Inline products have also been integrated into the Extron Dealer- and Consultant-Only Web sites. At this moment, you can find Inline pricing on the Dealer-Only site in dollars and Euros (the currency you see is dependent on your user ID and password). You can now place orders online for Inline products and view pricing and availability in the Dealer-Only site. This site is a great resource for product information, placing online orders, tracking your orders, viewing and subscribing to Extron publications, accessing the Matrix Builder and Projector Cross Reference tools, B-stock availability, and signing up for Extron Institute.

Duplication of Extron and Inline Product

As you know, there are a number of duplicate products in the Extron and Inline line-ups. One of our objectives is to make sure those dealers committed to an Inline product model will not have the rug pulled out from under them by forcing them to switch to Extron product. However, it does not make sense to have duplicate models at the same price forever. We have contacted many of you who are purchasing products from both lines and found that you concur. If you have not been contacted and would like to let us know your thoughts on a particular model, please contact us.

Lead Time for Product Line Changes

The consensus from all our dealers and consultants is that any product changes should be given careful consideration and only be made with plenty of advance notice. Lead time is needed for you to notify your customers, such as federal government agencies on contract. With enough time, an authorization for change can be processed whether it is for an Extron or Inline product. We certainly hope you will continue with an Extron product if an Inline product is discontinued. Eventually, all Inline products will be silkscreened with the Extron logo and the Inline model number for identification.

120-Day Notification

Many of you requested a notification of at least 90 days when we discontinue product. Let me assure you that we will give you a minimum of 120 days notice of any affected product as we combine the product lines.

InfoComm 2003 Targeted for Line Changes

Although there will be a few models announced for change or discontinuation early in the year, most changes will take

effect at the time of InfoComm in June 2003. By the time you read this, you will have received this notice.

Product Availability After Discontinuation

Although some Inline or Extron products will be discontinued, product may still be available by request. If you have a special need for a discontinued product, you should contact us and inquire about our ability to find the product. We may have a few pieces left or enough raw materials to create a special run for you, depending on quantity.

Inline Price List, CD-ROM, and Product Catalog

Since the Extron and Inline combination was announced, we have created and published several marketing and resource materials to help you select and purchase Inline products. These include a downloadable Inline price list on our Web site, a printed dealer price list, a New Products brochure for Photokina, and advertisements and brochures for products such as the IN1404XT Video/RGB Scaler and the VTT001CM and VTR001CM Twisted Pair Transmitter and Receiver modules.

We recognize your need for more updated Inline information. Because the Inline catalog and CD have not been updated for almost two years, we have recently created a new Inline product CD that is the most up-to-date and comprehensive Inline product resource available. In addition, look for a new combined CD in early 2003 containing all Extron and Inline products. All of these items replace the previously published Inline 2001 CD, the Inline 2001 Product Catalog, and the Inline 2002 Confidential Dealer Price List. Again, watch our Web site for continual updates.

Product Line Evaluation

A thorough review of all products by the combined Extron and Inline product development team is underway. The primary development team at Inline consists of Art Garcia, President; Mike Andrews, Vice President of Marketing; and Manfred Schneider, Vice President of Engineering. In the past few weeks, Dave Pincek, Extron Vice President of Product Development; Jeff Gibson, Vice President of Sales; Lee Dodson, Vice President of Marketing; and myself have been meeting with our former Inline counterparts, now a part of our team, to reposition both product lines for the future. Our objective is to bring you a combined product line that will offer the best price and performance in the market.

We have already determined, for instance, that the Inline architectural products with smaller AAP plates will be added to the Extron line. These products complement the Extron line and provide an even wider breadth of connectivity options.

Inline Product Warranty Past and Present

We recently announced that support for all Inline products is now provided by Extron regional offices. This means customers worldwide now have closer support teams that speak many of the local languages, and as a result, customers will receive a faster response. In addition, the warranty for Inline products has been extended from two years to three to match the Extron warranty. **All Inline product warranties, past and future, are now honored by Extron.**

Repurchase of Inline Distributor Inventory

To minimize any impact on our international distributors affected by this change, we have repurchased all Inline inventory from them. Customers can be assured that Extron will continue to honor product warranties on prior Inline purchases from distributors.

Looking Forward

Our combination has been very successful so far. Please bear with us as we continue our plans to make Extron a better company for you, our customers. Already, we have added substantial human resources to the Extron team to help us manufacture better products with a faster engineering cycle. As always, Extron will continue to provide the highest-quality A/V products, education, and industry-leading customer support. Thank you for your input and patience during this transition.

Available now are the Inline Dealer Price List (left) and Inline Catalog on CD-ROM (above).

by Steve Somers, Vice President of Engineering

SDI Through Analog Video Distribution Equipment: A Good Idea?

A/V applications for digital video over the serial digital interface, or SDI as it's commonly called, are on the rise. Originally just the realm of television production and broadcast operations, SDI is used more often to convey professional quality component video among systems. Many system designers are aware that the nominal SDI data signal level is just under one volt, 0.800 volt to be exact. So, a question that often arises is: "May I use analog hardware [switcher, router, DA] for SDI?"

The correct answer depends on a number of factors. This is like asking if you could drive your car 100 miles per hour through your city's downtown. First, we know it is illegal based on speed limit postings; but, aside from that, could you do it successfully? Well, sure, if all the lights are in your favor, there are not any pedestrians, no one violates a traffic signal, and police are not around. You just might pull it off. The probability of success, however, is hard to calculate. It would certainly be a hot story to tell over a cold beer. Most likely, some cold beers have set the stage for some similar bar bets.

So, here we are with the question. The SDI police are not going to fine you for routing through an analog system. Moreover, since this is an engineering-oriented column, you probably can guess that I'm not simply going to say "YES" or "NO." I've still got a few pages to fill here and, besides, when have you ever gotten a simple answer from an engineer? We are too busy specifying all the variables before qualifying an answer…to several decimal places. In fact, did you ever ask an engineer a question and note a very slight reciprocating motion in his eyes, whilst he is calculating an answer? This is the brain encountering a momentary 1/2 LSB rounding error.

Serial Digital Road Course

The impetus for serial digital coding and transmission of video heightened with the introduction of the first component digital production video tape recorder in the mid-'80s, known as D1 or CCIR 601. (For more background on the origin of SDI, see my article "Getting the Most from SDI" from the March/April 2001 issue of ExtroNews or download it from the Technologies section of our Web site under the Digital Video icon.)

SMPTE 259M supports four SDI transmission rates and SMPTE 292M supports 1.485 Gbps for HD SDI. (Refer to **Table 1**). Currently, most serial digital application situations involve standard definition television, so I'm going to use the most popular of the four standard definition rates, NTSC serial digital component, as the typical example.

Component serial digital requires 10 times the clocking rate of the parent parallel system, or 270 megabits per second. The SDI encoding algorithm ensures enough signal transitions to embed the clock within the data and minimize any DC component. SDI coaxial cable drivers AC-couple the serial data into the transmission cable, thus providing DC isolation between the source and receiver (See **Figure 1**). Minimizing any DC component is important for recovery of the clock and data as will be discussed later. The receiving device contains the same algorithm for proper decoding and recovery of clock and data.

Maintaining Distance

First of all, it should be noted that devices designed for handling the SDI signal usually

	SMPTE 259M				SMPTE 292M
	Level A	Level B	Level C	Level D	Level D
Parameter	NTSC 4fsc Composite	PAL 4fsc Composite	525/625 Component	525/625 Component	High Definition 1080i & 720p
Data Rate in Mbps (clock)	143	177	270	360	1485
1/2 Clock Rate in MHz	71.5	88.5	135	180	742.5
Signal Amplitude (pk–pk)	800 mV	800 mV	800 mV	800 mV	800 mV
DC Offset (volts)	0 +/- 0.5	0 +/- 0.5	0 +/- 0.5	0 +/- 0.5	0 +/-0.5
Rise/fall Time Max. (nS)	1.50	1.50	1.50	1.50	0.27
Rise/fall Time Min. (nS)	0.40	0.40	0.40	0.40	–
Rise/fall Time Differential (nS)	0.5	0.5	0.5	0.5	0.10
% Overshoot Max.	10	10	10	10	10
Timing Jitter (nS)	1.40	1.13	0.74	0.56	0.67
Alignment Jitter (nS)	1.40	1.13	0.74	0.56	0.13

Table 1. SMPTE 259M and SMPTE 292M transmission rates and specifications.

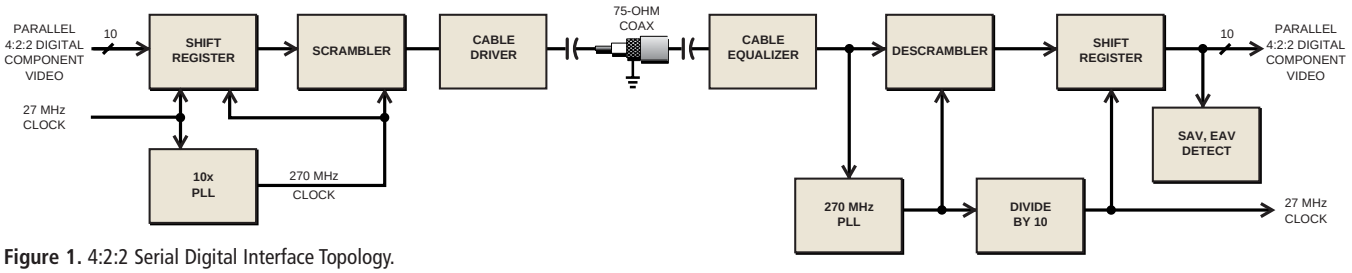


Figure 1. 4:2:2 Serial Digital Interface Topology.

have certain features that favor efficient SDI transmission. The most notable is "reclocking," which occurs at the receiver front end. Reclocking is a multi-step restoration process in which the digital signal is terminated in 75 ohms, the signal level equalized, the embedded data clock signal extracted and used to clock a data latch; after which the data level and timing is restored close to the original signal quality. Reclocking circuits involve stable phase-locked loop (PLL) circuitry whose job it is to lock onto the recovered clock signal and "clean up" the data by squaring up the edges while removing most noise and timing jitter (See **Figure 2**). Most SDI routers have reclocking circuits at the front end, back end, or both, depending on matrix architecture and size. SDI distribution amplifiers typically utilize reclocking at the front end. This feature is intended to clean up signal timing jitter so as to extend transmission distance, just as one might install line amplifiers in an RF distribution system to extend transmission distance. The two key forces affecting SDI transmission negatively are amplitude loss and timing jitter. If you design long distance SDI distribution systems and want to maximize distance and minimize risk, then reclocked devices are a must. This is particularly important for multiple connection schemes involving routers.

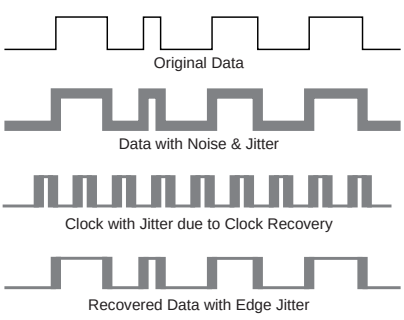


Figure 2. Data recovery with extracted clock.

Do you always need reclocking in a distribution device? No, with some qualification. Some SDI distribution situations could be run, without reclocking, through DAs and routers. Non-reclocked paths can work for the following reasons[1]:

- Good intrinsic signal fidelity in the signal routing system.
- Permanent path exists from an SDI device generating a pristine serial output, to a processing device having a receiver with good input jitter tolerance versus frequency.
- A well-designed serial digital receiver with a much wider input jitter tolerance (IJT) than an intermediate reclocker.

Admittedly, reclocking does complicate product design and cost. There are times when this feature can be a disadvantage. A router/reclocker with a wide PLL bandwidth in the output stage could inflict jitter on an otherwise good signal. Wide bandwidth PLLs are needed mostly at the input of the router. The PLL range is expected to allow the system to capture at all SMPTE serial bit rates.[1] One expects the matrix router manufacturer to pay careful attention to this issue.

In contrast, to distribute SDI through an analog router without reclocking, the designer must be well aware of system performance. Steps must be taken to ensure operation within the serial digital receiver's design margins for effective design implementation and avoidance of service calls. A receiver designed to work with SMPTE 259M signals, for example, will expect to "see" a standard signal attenuated primarily by the coaxial cable frequency response losses. Any deviation from a nominal -6db/octave roll-off over a bandwidth of one megahertz to the clock frequency will cause improper operation of the automatic equalizer in the serial receiver.[2] Analog signal router compliance to this issue can be difficult to guarantee, even though its characteristics for analog signals are very adequate. Considering the complexity of most analog routers, this risk may not be worthwhile.

Know the Warning Signs

Let's say you want to implement an analog router for SDI. What obstacles are likely to lie in the road? In my hypothetical analogy, the posted speed limit would be the usable bandwidth (-3db point) of the analog system. It happens, by virtue of its data coding scheme, a 270 Mbps SDI transmission corresponds to a 270 MHz bandwidth requirement. Any analog device having less than 270 MHz bandwidth (-3db) through any routing path will significantly affect data integrity over any long distance by immediately slowing the data edge rise and fall times for that path. Further, analog bandpass response may not always be flat,

continued on next page

which can affect frequency components of the SDI unevenly, like speed limits changing from one city block to another. Pre-emphasis, or peaking, which may be beneficial to analog computer graphics transmission, can cause distortion or group delay effect, further limiting reliable serial digital data recovery. Group delay is the rate of change of signal phase shift with respect to frequency. Linear phase shift is a requirement for SDI routing devices. Moments ago, we learned of the effect of non-standard bandwidth roll-off on receiver equalization.

The physics of analog losses affect components of digital signals just like analog signals. Digital signals are simply the conveyance of a number or numbers represented by subsequent changes in electrical value or level. These level changes and the rate at which they change (the rise and fall time) are analog features that are affected just like any other analog signal. Digital receivers reach the "cliff" and stop decoding the proper message when levels and transitions can no longer be recognized. Other loss factors are *cable loss* (the largest one), system noise leading to *signal jitter*, and any imparted *DC component.*

Cable Loss

Applying reclocked devices and following coaxial cable loss guidelines for SDI will provide a significant measure of confidence in system reliability. Well-designed receivers, called Class A type, can recover serial digital data as low as –30db at one-half the clock rate from a pristine source, or about 25 millivolts. The one-half clock rate frequency is used to calculate SDI cable loss. Follow the cable's specified insertion loss figure for 100 feet at the one-half clock rate value. For 270 Mbps component SDI, the rate would be 135 MHz. Divide that dB loss value into 30 and the result will be the number of multiples of 100-foot lengths that can be used. Cable manufacturers often provide a table of distances that shows the SDI or HD SDI rates that can be run with each type of appropriate cable in the product line. Usually, the lengths indicated include a 10% length reduction allowance to establish some margin against the cliff effect. See **Table 2** for some examples.

Timing Jitter

Signal jitter, or random timing uncertainty, occurs as serial digital signals pass through the various devices in any distribution system, digital or analog. Small amounts of internal phase noise, power supply noise modulation, and processing stage threshold variations are all factors contributing to increased signal jitter. **Figure 3** shows a typical, clean SDI signal. Compare that to **Figure 4**, where the jitter level is substantial. The opening in the pattern is called the "eye" and the pattern is routinely called an "eye pattern". Comparing the two figures,

	SMPTE 259M				HDTV	
	Level A	Level B	Level C	Level D		
Application	NTSC 4fsc Composite	PAL 4fsc Composite	525/625 Component	525/625 Component	HDTV	
Data Rate in Mbps (clock)	143	177	270	360	1485	
1/2 Clock Rate in MHz	72	89	135	180	743	
Extron Cable Product	FEET / METERS	FEET / METERS	FEET / METERS	FEET / METERS	FEET / METERS	
Mini-HR (22-020-xx)	583 / 178	531 / 162	428 / 130	365 / 111	94 / 29	
RC (22-127-01) [1]	813 / 248	736 / 224	600 / 183	519 / 158	150 / 46	
HR (22-124-02)	1034 / 315	944 / 288	801 / 244	687 / 209	188 / 57	
SHR (22-098-02)	1406 / 429	1274 / 388	1067 / 325	915 / 279	285 / 87	

Table 2. Recommended Serial Digital (SDI) transmission distances through coaxial cable. [1]: 24 gauge design

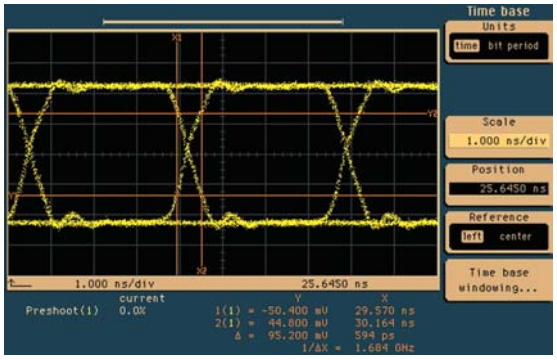


Figure 3. Standard reference level SDI signal conforming to SMPTE 259M.

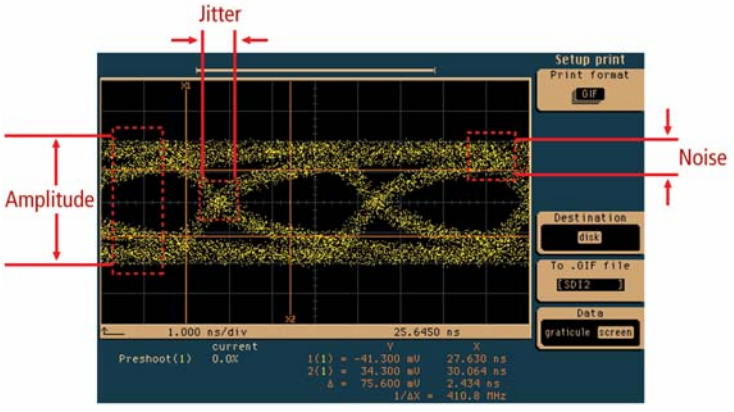


Figure 4. Eye pattern shows normal cable losses, yet jitter is still well within specs.

Standard	Period (ns)	Jitter Spec	% of Clock
AES/EBU Audio	163	40.0	25%
Serial NTSC	7	0.5	7%
Serial PAL	6	0.5	9%
Serial Component	4	0.5	14%
Parallel NTSC	70	10.0	15%
Parallel PAL	56	10.0	20%
Parallel Component	37	6.0	16%
Parallel HD	7	1.0	14%

Table 3. Typical Jitter Specifications.[2]

you can see that the more open the eye pattern, the easier it is to discern the signal. As jitter and amplitude loss increase, the eye pattern closes down until the receiver is no longer able to lock onto the data transitions and recognize the clock signal within. When the receiver loses sync with the recovered clock, you have encountered the cliff effect.

As long as the jitter does not exceed a certain threshold (which is solely dependent on the receiver design), digital signal recovery is possible and the signal is synthesized back to its original quality. In practical systems, the clock signal is extracted from the data stream and will still contain some jitter, depending on the qualities of its PLL system. Having some jitter is not necessarily detrimental if the clock jitter is following along with the data jitter and positioning the decoder in the middle of the eye pattern.[2] **Table 3** lists some typical jitter specifications.

DC Component

Analog television signals are usually AC-coupled from one system to another. For basic signal amplification, this works well, since the signal's positive and negative excursions will center on the average DC value of the signal. This ensures that the signal stays within the linear range of the amplifier. AC-coupling is desirable also because terrestrial transmission of the signal, recording to tape, or signal processing hampers the maintenance of this DC reference point. Cascaded signal handling systems either have their own DC operating reference or cannot process a signal with a DC component. The video display, ultimately, must restore the signal's DC component.

Why? During creation, the black reference for the signal was tied to a specific DC voltage, which could be used to calibrate the light output threshold of the display system. Reestablishment of this threshold is essential for proper control of the point where the display just produces light output.

Even though SDI is digital, the establishment of a DC operating point is critical to its proper decoding. The AC coupled data stream, without a DC component, will be centered about the central operating point of the input signal equalizer/amplifier. A next step in the process involves lowpass filtering of the data signal, which re-establishes the correct DC operating point for the incoming data. Restoring the DC component in the receiver provides the correct switching threshold for the downstream processing logic.

The Mechanic's Tools

Evaluating SDI transmission quality is straightforward with the right test equipment. The best tool to have in the trunk alongside your jumper cables is a serial component monitor. Specialized serial digital test gear will evaluate the signal electronically via computerized measurement algorithms to certify its performance level at any point in a distribution system. While an actual waveform display is not necessary for characterization of signal performance, it provides the technician with visual confirmation of the testing activity.

Serial digital signals can be roughly evaluated with a standard oscilloscope, provided it has enough bandwidth. At a minimum, the technician can determine, with some degree of success, the likelihood of proper data recovery by measuring the eye pattern level, comparing the estimated jitter at transition crossovers to the allowance in the table, and verifying that the eye is open to some degree. When signal level is down near the limits of a Class A receiver's capability, only the intended receiver or a serial digital monitor will suffice. The best course of action is to invest in a component monitor that can make definitive signal margin measurements, which will guarantee that you know your proximity to the operational cliff.

Slowing to a Stop

Hopefully this article proves helpful and removes some of those SDI implementation roadblocks in your path. I intended to present enough information to clarify the real issues for and against SDI routing with analog equipment. Our position at Extron is to recommend routing serial digital with equipment specifically designed for the purpose of minimizing design time and risk. Our stance is often in opposition with some equipment manufacturers that visibly push the application of their analog products but do not always provide enough information to guide a complete, reliable design. We feel that if you have the education, test equipment, and the confidence to proceed with application of analog systems for SDI distribution, then by all means, take advantage of it, as it can be highly successful and lower in cost. However, if you do get caught in an analog speed trap, give us a call…we'll find a way to fix your ticket.

REFERENCES:

1. "Routing Switcher Technology," by Barry W. Albright, Broadcast Engineering, July 2000.

2. "A Guide to Digital Television Systems and Measurements," by David K. Fibush, pp. 21-36, Copyright 1997, Tektronix, Inc.

NEW

BBG 6 A
Blackburst and Audio Generator

The Extron **BBG 6 A** Blackburst and Audio Generator is designed for use in broadcast, production, and presentation environments that require reference signals for genlocking video systems. The BBG 6 A offers six broadcast quality, NTSC or PAL blackburst output signals, allowing a variety of video equipment to be genlocked to a common reference signal. In addition, the first two outputs can generate test patterns for NTSC SMPTE Color Bars or PAL full-field Color Bars, simplifying system troubleshooting and alignment. The BBG 6 A also comes with a 1 kHz audio generator with balanced or unbalanced audio on captive screw connectors. Part of the VersaTools™ line of products, the BBG 6 A is housed in a 1U high, quarter rack width metal enclosure, making it ideal for installation in small spaces or portable field use.

BBG 6 A

Part Number	List Price:
60-535-01	$445.00*

URL
www.extron.com/bbg6a

* Prices listed in US Dollars, valid for US sales only.

NEW

Compression Tools and Connectors

Compression Coax Prep Tool

Universal Compression Tool

Compression BNC Connectors

The Extron **Universal Compression Tool** offers installers the convenience of using a single tool for terminating multiple connector types with professional and reliable connections, while the Extron **Compression Coax Prep Tool** prepares the Extron Mini HR, HR, and SHR cables for termination. Used in conjunction with Extron **compression BNC connectors**, compression tools terminate cables in three simple steps, providing cable connections that withstand an 80 pound pull test for SHR and HR cable and a 30 pound pull test for Mini HR. Compression BNC connectors are available in nickel and gold plated versions for Extron Mini HR, HR, and SHR cables and provide 75 ohm impedance. SHR and Mini HR BNC Compression Kits are also available, which include a compression tool, prep tool, and 50 BNCs in a convenient carrying case.

Compression Tools and Connectors

Part Number	List Price:
Compression Coax Prep Tool	
100-183-01	$60.00*
Compression Coax Prep Tool Replacement Blades	
100-184-01	$14.00*

URL
www.extron.com/compcoaxprep

Universal Compression Tool for (BNC, F, RCA)	
100-181-01	$220.00*

URL
www.extron.com/univcompress

BNC male Mini HR (26 AWG), SHR (18 AWG), and HR (20 AWG) compression connectors are available in nickel and gold plated.

URL
www.extron.com/compbncconn

* Prices listed in US Dollars, valid for US sales only.

NEW

IPL T S2
Ethernet-to-Serial Interface

IP TOOLS™

The **IPL T S2** is a compact Ethernet-to-serial interface with integral web server that enables almost any A/V device to be controlled, monitored, and accessed from any computer connected to a Local Area Network (LAN) or the Internet. IP connectivity enables operation of projectors, plasma displays, switchers, and many other products, giving users the ability to remotely control and proactively monitor and troubleshoot A/V systems. With two serial ports, the IPL T S2 can be integrated into existing A/V systems. The IPL T S2 uses Extron's exclusive IP Link™ technology, which is specifically engineered to meet the needs of professional A/V environments. IP Link technology enables serially controlled (RS-232/422/485) products to be connected to Ethernet, and it has proven its reliability in many Extron products, including the Matrix 12800.

IPL T S2

Part Number	List Price:
60-544-01	$495.00*

URL
www.extron.com/iplts2

* Prices listed in US Dollars, valid for US sales only.

NEW

MPS 112

Media Presentation Switcher

The Extron **MPS 112** Media Presentation Switcher merges three independent switchers into a single enclosure: a four input, one output VGA with stereo audio switcher; a four input, one output S-video with stereo audio switcher; and a four input, one output composite video with stereo audio switcher. In addition, any audio input can be routed to the Program Audio output (with volume and mute controls), which also provides a convenient microphone talk-over mix feature. Together with a wide range of other audio enhancements, the MPS 112 offers a unique feature set, can be controlled via the front panel buttons or RS-232, and is designed as a cost-effective solution for signal routing applications that usually require three separate switchers, such as small conference rooms, boardrooms, classrooms, and rental and staging environments. The MPS 112 comes in a 1U, full rack metal enclosure, and is rack mountable.

MPS 112

Part Number	List Price:
60-532-01	$695.00*

URL
www.extron.com/mps112

* Prices listed in US Dollars, valid for US sales only.

NEW

P/2 DA2xi & P/2 DA2xi MT

Two Output VGA-UXGA Distribution Amplifiers

P/2 DA2xi

P/2 DA2xi MT

The Extron **P/2 DA2xi** and **P/2 DA2xi MT** are one input, two output, high-resolution VGA distribution amplifiers. Both new models come in smaller-sized, rugged metal enclosures that can be easily installed in small, tight places. They're even portable enough to fit into a briefcase for presenters on-the-go. Either model can be powered via pin 9 of a computer's VGA connector if it has a graphic card that complies with the VESA DDC standard, Version 3. Both DAs will also work with older computers by using the included external desktop power supply. Each model offers 350 MHz (-3dB) of RGB video bandwidth, and is compatible with VGA-UXGA graphic cards, monitors, and projectors. Adjustable gain and peaking are DIP switch-selectable to compensate for long cable runs. The P/2 DA2xi MT also includes stereo audio buffering and features a 3.5 mm female jack for audio input and a captive screw connector for balanced or unbalanced stereo output. The P/2 DA2xi includes an Extron high-performance detachable six foot male to male VGA cable, while the P/2 DA2xi MT includes the same cable with audio. Housed in quarter rack width enclosures, the P/2 DA2xi and P/2 DA2xi MT can be mounted a variety of ways to suit virtually any application or environment. With an optional VersaTools™ or Universal Rack Shelf Kit, either DA can be rack-mounted alone or with three other quarter rack width A/V products. There are also optional mounting kits available to mount the P/2 DA2xi and P/2 DA2xi MT under a desk or next to a projector. The P/2 DA2xi MT includes its own under-desk mount.

P/2 DA2xi and P/2 DA2xi MT

Part Number	List Price:
P/2 DA2xi	
60-506-01	$230.00*
P/2 DA2xi MT	
60-506-02	$420.00*

URL
www.extron.com/p2da2xi

* Prices listed in US Dollars, valid for US sales only.

More New Products continued on next page.

NEW

VSC 500

High-Resolution Computer-to-Video Scan Converter

The Extron **VSC 500** high-resolution, computer-to-video scan converter is a combination of high-performance processing, features, and value. It accepts computer images with resolutions up to 1600 x 1200 and scan converts them for output as composite video, S-video, component video, and/or RGB video. Applications include videoconferencing, video recording, and viewing the images on a PAL or NTSC monitor or other video display device. Key features include Auto-Image™ setup for automatic adjustment of centering, sizing, and filter settings; zoom control up to 200%; an LCD window for user-friendly menu navigation; memory presets; and a buffered loop-through for local monitor output. The VSC 500 can be controlled via the front panel, the included IR remote, or RS-232.

VSC 500

Part Number	List Price:
60-476-01	$1,295.00*

URL
www.extron.com/vsc500

* Prices listed in US Dollars, valid for US sales only.

NEW

VSC 700 & VSC 700D

High-Resolution Computer-to-Video Scan Converter

VSC 700D

The Extron **VSC 700** and **VSC 700D** high-resolution, computer-to-video scan converters combine high-performance processing with an expanded feature set, including a BNC RGB input with a loop-through output for easy integration. Both models are designed to be integrated into applications such as videoconferencing, video recording, and viewing the images on an NTSC or PAL monitor or other display device. They are also effective in broadcast environments with the ability to genlock to an external black burst signal. The VSC 700D also includes an SDI digital output for incorporating digital video devices into video production studios, non-linear editing suites, staging events, and video broadcast studios.

VSC 700 & VSC 700D

Part Number	List Price:
VSC 700	
60-477-01	$1,895.00*
VSC 700D	
60-477-02	$2,895.00*

URL
www.extron.com/vsc700

* Prices listed in US Dollars, valid for US sales only.

NEW

VSC 900 & VSC 900D

Dual Input High-Resolution Computer-to-Video Scan Converter

VSC 900D

The Extron **VSC 900** and **VSC 900D** are dual input, high-resolution, computer-to-video scan converters that combine high-performance processing with a premium feature set.

The VSC 900 and VSC 900D include all the same features and capabilities as the VSC 500 and VSC 700 models, but offer eight levels of vertical flicker and eight levels of horizontal filtering, while the VSC 900D offers a digital 4:2:2 output. Exclusive to the VSC 900 line is the ability to upgrade firmware through the RS-232 port. This gives users convenient access to the most up-to-date firmware files via the Extron Web site.

VSC 900 & VSC 900D

Part Number	List Price:
VSC 900	
60-478-01	$3,995.00*
VSC 900D	
60-478-02	$4,995.00*

URL
www.extron.com/vsc900

* Prices listed in US Dollars, valid for US sales only.

Extron New Product Showcase and Cocktail Reception at the Venetian, Las Vegas

April 7-9

Attending NAB2003 in Las Vegas?

This year you won't find Extron on the NAB show floor. You'll find us at the Venetian Hotel, just a short taxi ride from the Las Vegas Convention Center (see map). We wanted to provide a more spacious, personalized setting in which customers can view our latest products and meet with Extron representatives.

Extron is hosting a special **New Product Showcase** April 7-9 at the Venetian, Las Vegas, Ballroom G. From the latest in our architectural series to our next-generation scan converters and remote management tools, Extron continues to provide quality product solutions for professional A/V systems. This is your opportunity to see working station demonstrations of our most recently released products, including the IPL T S2 Ethernet-to-Serial Interface, the BBG 6 A Blackburst and Audio Generator, and more.

Also, Customer Support Representatives, Regional Managers, Application Engineers, and Consultants will be available to answer your questions about any Extron product or service. Complimentary snacks and beverages will be served during each day.

Don't miss the **Extron Cocktail Reception** that takes place in the same location on Monday, April 7th, and Tuesday, April 8th each evening.

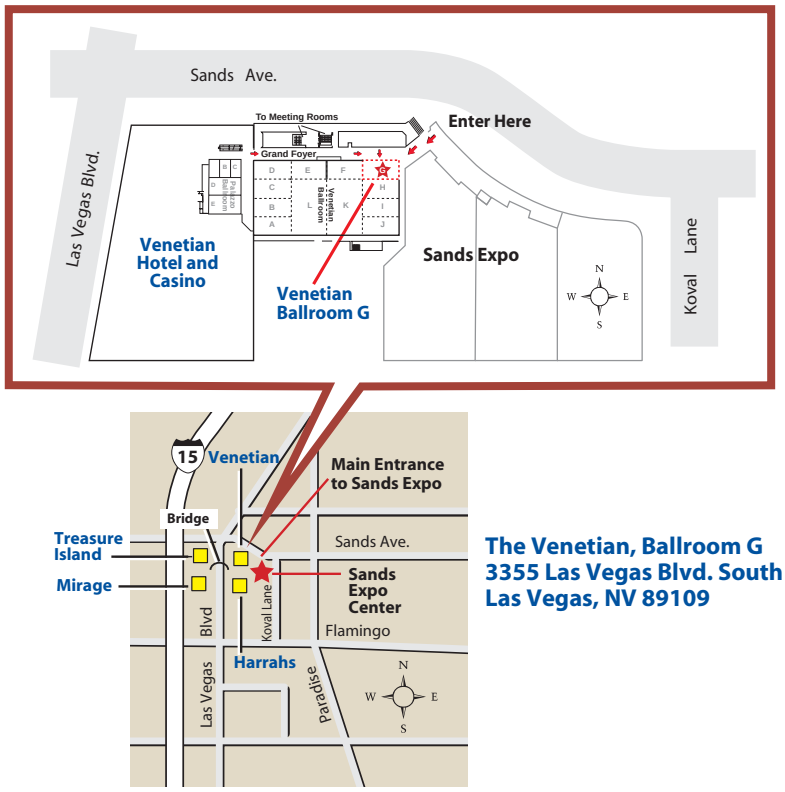
To schedule an appointment with a regional representative or to RSVP for the Cocktail Reception, call your Customer Support Representative at 800.633.9876.

Extron New Product Showcase

At The Venetian, Las Vegas—Ballroom G

Monday, April 7 ..... 8:30 am - 6:00 pm
Tuesday, April 8 ..... 8:30 am - 6:00 pm
Wednesday, April 9..... 8:30 am - 12:00 pm

DIRECTIONS TO THE EXTRON SHOWCASE AND COCKTAIL RECEPTIONS AT THE VENETIAN HOTEL & CASINO, BALLROOM G



The Venetian, Ballroom G
3355 Las Vegas Blvd. South
Las Vegas, NV 89109

Cocktail Reception

You're invited to the Extron Electronics Cocktail Reception

Where: The Venetian, Las Vegas—Ballroom G
3355 Las Vegas Blvd. South

When: Monday, April 7, 2003
Tuesday, April 8, 2003
6:00 pm — 9:00 pm

RSVP: Contact your Extron Customer Support Representative with names of all your company's guests and night(s) you plan to attend.

Eliminate Your Sync Problems, Part II

A Shotgun Approach to Troubleshooting Sync Problems in RGBHV Systems

One of the most common problems affecting high-resolution display systems is bad sync, which occurs when either one (or both) of the H and V signals is not effectively delivered to a display device.

As discussed in the last issue of ExtroNews bad sync can exhibit itself in a number of different ways, including a flashing image or no image at all. Bad sync can also be the result of reflections and cable problems. Troubleshooting these scenarios will be addressed in this installment.

Scenario 3 – Sync Signal Reflections

Reflections present in H and/or V sync lines may result in flashing, rolling, scrambled images, or no image at all. Sync reflections occur when the output impedance of the H and/or V sync lines from a source, such as a computer graphics card, are not matched to the input impedance of a display device, such as a projector. While the industry standard for the input and output impedance of RGB connections is set at 75 ohms and well adhered to by manufacturers, no adherence to such a standard exists for sync connections. Because this standard is not observed, reflections are present in almost every sync line in existence. Reflections are exacerbated by longer cable runs, higher sync frequencies, faster rise times, and disparity in the characteristic impedance of cables with respect to the input and output impedances of sources and displays. As a result, sync reflections can cause problems, but don't always, and can be very hard to actually verify. Fortunately, they are usually easy to fix.

Solutions: Resolutions to sync reflection problems depend on the system in which the problem exhibits itself.

A) A computer cabled to a display device directly, typically through a longer run of cable without a computer-video interface or distribution amplifier (DA) to buffer the sync lines, is the most common scenario in which sync reflection problems will exhibit themselves. Try buffering the sync signal at the source by installing a computer-video interface, DA, or a line driver, such as an Extron Peaker or Extender, at the computer to resolve the problem.

B) A display device cabled to a source in a system that includes computer-video interfaces or other sync buffering devices can also occasionally exhibit sync reflection problems. This may occur with some specific sources but not others. Try matching, or more closely matching, the sync impedance by adding additional termination at the display device, as follows:

On display devices which use BNC connections, remove the sync line at the display device and attach a BNC T connector with a 75 ohm terminator to the sync input of the display device. Then, connect the sync line to the remaining connector on the BNC T connector. Try the V sync line first, then the H sync line, then both. This must be done at the input to the display device, as opposed to attaching such "double termination" upstream at the output of the signal source. Attaching this kind of "double termination" at the output of an upstream device will increase an impedance mismatch, and probably make this problem worse.

A BNC T connector is used at the display device input for additional termination and to reduce sync reflection.

On display devices which use 15-pin HD connectors, an Extron Laptop Sync Termination Adapter (LSTA) or Laptop Sync Coupling Adapter (LSCA) can be used. Remove the input cable from the display device's input connector, plug the LSTA or LSCA into the vacated input, and plug the cable into the input of the LSTA or LSCA. Again, these devices must be used at the input of the display device for the same reasons noted above.

An Extron Laptop Sync Termination Adapter (LSTA) is used for display devices that have a 15-pin HD connector.

In more severe cases, an active or powered termination must be used at a display device. An Extron Active Sync Termination Adapter (ASTA) can be installed at display inputs with a 15-pin HD input, or an Extron SS 200 can be used at display inputs with either a 15-pin HD or RGBHV connectors. These are the most expensive pieces of corrective

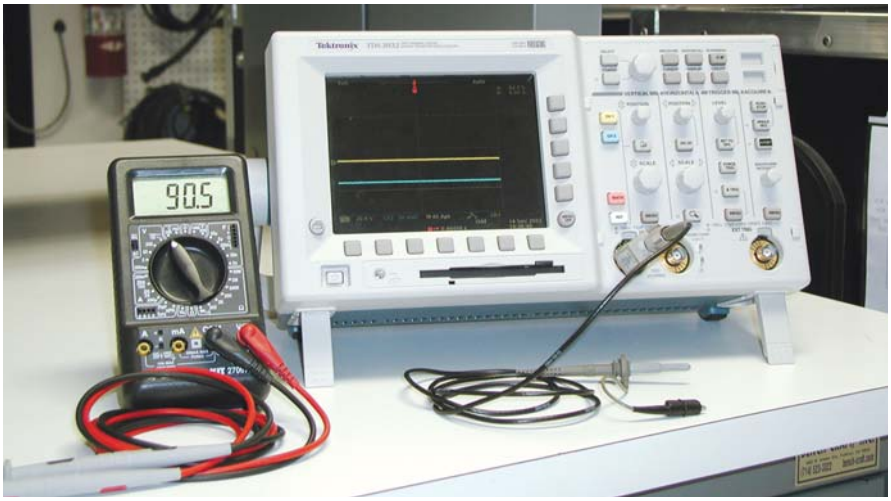
equipment for this type of problem and should be reserved for the worst case scenario. In some extreme cases, when the application has justified the expense, the Extron RGB 202 Rxi has been used to resolve this type of problem.

Scenario 4 – Cable Problems

A "Cable Problem", refers to a defective, damaged, or poorly terminated cable exhibiting either a discontinuity or a short circuit between one end of a cable and the other. Cable problems may be the most common problem encountered in A/V systems, whether sync related or otherwise. Cable problems might not seem appropriate material to cover in an article on the technical tricks of troubleshooting; after all, once a cable problem is identified, it's usually time to either pull another cable or cut off the old connector(s) and re-terminate. There's not much to it except repeating some good old fashioned hard work. However, identifying cable problems can be a bit more technically challenging than fixing them, and thus, the "Cable Problem" sneaks its way into this publication.

Solution: A bad cable for composite sync, H sync, or sync on green will typically result in a scrambled image or no image at all. A bad cable for V sync will result in an image rolling vertically or no image at all. Once these kinds of problems are seen, checking the integrity of cables is a good next step.

Testing the integrity of a single coax cable in an RGBHV snake can usually be done by swapping it with a known existing cable. For instance, if an image rolls when connected to RGBHV, vertical sync may not be passed. Try swapping the blue cable for the V-Sync cable. If the image passes, but no blue elements of the image appear, the V-Sync cable is bad.



A Digital Multimeter (DMM) and an oscilloscope can be used to test the integrity of sync cables.

An oscilloscope can also be used to test cable integrity of sync cables. If the scope can see the sync signal at the far end of the cable run, the cable is good, and if not, it's bad. It's important to note that the signal at the input end of the cable must be verified to draw the latter conclusion.

Another means to verify the integrity of a cable is to use a Digital Multimeter (DMM), to test for a short circuit or an open circuit in the cable. While testing for a short circuit at one end of a cable is easy, the leads of a DMM don't typically reach from one end of a cable to the other to test an open circuit condition. It is necessary to short or jumper two conductors together at the far end of a cable in order to use a DMM to test continuity at the near end.

The DMM is also quite handy in identifying if a problem is present in a connector or somewhere in a cable itself. Once a cable is determined to be bad, the terminating connectors become the first point of failure to be looked at. If, however, re-terminating does not resolve the problem, and/or inspection shows the terminations to be sound, a DMM may be the only method to test the cables themselves for shorts or opens.

For those who carry a Time Domain Reflectometer (TDR) wherever they go, it can be used to pinpoint the exact location of a problem in a cable.

In any case, once the problem cable is identified, and the problem specific to that cable is established, the cable must be re-terminated or replaced. While repairing an open or shorted cable within an installation is possible, it is rarely practical or cost-effective.

Conclusion

And that concludes this guide to troubleshooting some of the most common causes of the bad sync phenomenon. We hope this article leaves you with a few more shells to shoot your way clear of A/V trouble.

The Extron MLC 206 Emulation Software

Simplifying Installation Through Preconfiguration

Extron MLC 206 Controller

When installing A/V equipment, what would you consider your most useful and time-saving tool?

Consider emulation software—and other Extron-created tools—to help you complete the job using the least amount of time and labor. Emulation software allows you to complete a significant portion of your job away from the installation site and without the equipment present. It allows you to preconfigure an A/V unit—such as a switcher, matrix, or other MediaLink control unit—before the unit is shipped to your door.

Emulation software capabilities vary with the product you're configuring, but can include selecting switcher and control modules, and designating command strings, ties, and pre-sets (for recalling predetermined configurations). The capabilities increase with the product's complexity. Due to its features and benefits, emulation software is one of the most useful and beneficial tools available for A/V professionals.

Undeniable Benefits

Because preconfiguration can be completed without the hardware present, and without access to the installation site, A/V professionals benefit in several ways. With emulation software, a preconfigured file provides:

- **Time Savings** – You can configure the software at your own convenience on your PC—just download the software from www.extron.com.
- **Reusability** - Create one file for replication in several rooms, or save it as a backup for restoration or troubleshooting.
- **Education** – Train yourselves and others on the product at your leisure.
- **Support** – An Extron applications engineer can troubleshoot over the phone by walking through your setup or viewing a saved file.
- **Flexibility** – Save several configurations when the environment is uncertain.
- **Turnkey Installation** – Create the file offsite, and then upload to the unit in minutes.

Emulation software isn't new; it's been available in Extron products since the early 1990s. Prior to its inclusion, an A/V professional configuring equipment for multiple rooms would go to great lengths to complete the job. For example, a 20-room training center with the same equipment in each would require that professional to configure all 20 units individually. Or, at an approximate cost of $100 per hour, a programmer would do the job. If each room needed two hours of configuration, a 40-hour week was spent on just that task, and at a cost of $100 per hour…you get the idea. It was expensive, time-consuming, and labor-intensive.

Fast forward to the next decade and the creation of emulation mode in control software. The A/V professional can configure the same job in much less time and at a great savings in time and money. (Plus, that programmer would now cost around $150 per hour!)

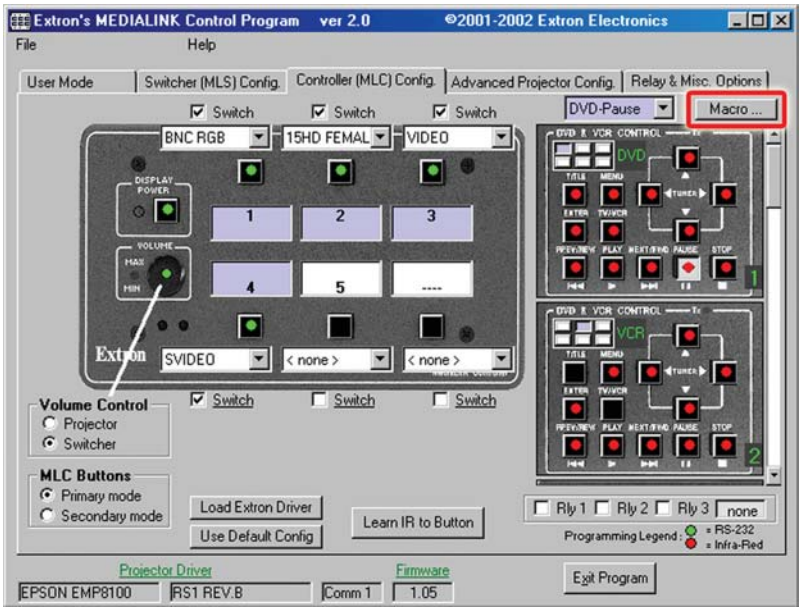
How Emulation Software Works

Let's look at the use of emulation software in the Extron MLC 206 MediaLink Controller. In case you're not familiar with the MLC 206, the MLC 206 serves as a universal system control panel with commands for a VCR, DVD, and a projector consolidated into one unit. It's frequently used in one-projector environments, such as a classroom. Its simplicity makes presentations easy for anyone to operate. With one-button functionality, the MLC 206 can also control room functions such as lighting and screen settings, projector power, input switching and volume control. The MLC 206 is part of the Extron MediaLink system and can be combined with a MediaLink switcher when more inputs are needed.

To begin, you don't need the actual product in hand, just the control software. You can download this free of charge from the Extron Web site, www.extron.com, in the Download section. Once the software is installed and opened on your PC, select "emulate" instead of a serial port, and you're on your way.

In the MLC 206, up to four control modules, as well as all MediaLink switchers, can be set up. Emulation mode also provides projector setup and configuration. The setup is intensive due to the amount of information to input, and emulation mode provides an advantage of programming the unit in segments and saving the file for further modification at the user's convenience. In addition, items such as projector codes must be exact, so the user may need to exit and return to the program several times when gathering information.

Five screens must be programmed in the MLC 206. The User Mode screen emulates the front panel of the MLC 206, where you can select inputs, control projector power and volume, and toggle relays. The Switcher Configuration screen allows you to adjust all audio options, including level, bass, and treble;



Controller Configuration Screen: MediaLink Control Software allows users to program the MLC 206 and other MediaLink products in emulation mode without the unit present.

overall volume; and left/right balance. You can also select video format and RGB delay period (for Triple Action Switching), and reset all controls to factory presets.

The Controller Configuration screen is where the most important action takes place: here, you can download Extron projector drivers, call video inputs on the projector for inputs 1-6, and access primary and secondary modes. You can also perform the Macro/Link function—a new feature that associates macros/control buttons with each other so that one button can control the commands of two. In emulation mode, the only inaccessible function of this screen is IR learning—the hardware must be present to complete this task.

Next is the Advanced Projector Configuration screen, where you can program RS-232 commands for the display device. Extron creates and administers a wide selection of commonly used projector control drivers. These RS-232 drivers are essential for the MLC 206 to effectively communicate with a display device. They enable the MLC 206 to control basic projector functions such as power, input selection, and volume adjustment. You can create your own drivers or go to the Extron Web site to download drivers for the latest and most popular projectors.

In environments where more customizable projector control is needed, integrators can easily create their own uni-directional RS-232 driver. RS-232 commands can be programmed to any button using a projector manual and MediaLink control software. With a list of commands, users can easily configure the MLC 206 to work with virtually any projector.

Finally, the Relay & Miscellaneous Options screen allows you to set the projector's shut-off time, associate relays, and access factory resets.

More Helpful Features

Emulation software plays a large role in simplifying the setup of the MLC 206. Additional features allow you to complete even more tasks in a short time: Macro/Link association and IR learning.

The Macro/Link function is the latest feature to be added to the MediaLink Control Program software (version 2.0). It facilitates the ability to create multiple commands with one-button control. Once two buttons are associated, you can press one button to trigger its own functions and all the commands associated with the other button. Consider this example of a speaker in a meeting room: The MLC 206 can be set up so that pressing input 2 causes the system to switch from input 5 to input 2, send a video format change command (from S-video to RGB) to the projector, and trigger a relay to turn the spotlight on over a podium. Now the audience can see the laptop-based presentation and the speaker.

As previously mentioned, IR learning is the only function that can't be performed while in emulation mode. However, with the MediaLink software and projector hardware, the MLC 206 can learn IR commands from virtually any IR controllable device. In its hardwired form, RS-232 is the preferred method of control; however, many ultra-portable projectors can only support IR control. IR learning can also be used with optional IR Control Modules (IRCM) that control source devices such as VCRs, DVD players, and audio tape decks.

The Final Proof: Testing Your Setup

After setting up your system using emulation software, you must, of course, test it. There is only one way to test functionality: with the hardware present and connected, preferably in the actual setting. And, like the chef who presents his culinary delight to the aristocracy for judgement, the proof of your work also will lie in the pudding.

The MLC 206 is just one product of many that can be preconfigured off site. Other Extron products that offer emulation mode in control software are CrossPoint matrix switchers, MediaLink products, System 5cr Plus and System 7SC switchers, the ISS 108 and ISS 408 seamless switchers with built-in scalers, and MAV stereo audio matrix switchers.

With the time and money savings, convenience factor, and support options, using emulation mode can be an important tool for almost any job. A stored file of preconfiguration setups can significantly reduce your time onsite and decrease errors. Installation becomes a turnkey operation. And much of the job can be completed from the comfort of your own office.

ExtroNews publishes information about new products that are relative to the Extron product line in the New News section. Also listed are the recommended Extron products that will complement these new display devices in their targeted applications. If you would like a new product to be reviewed for New News, please send a press release, literature, contact name, and a four-color slide or photo to: **New News c/o Lee Dodson, Extron Electronics, 1230 South Lewis Street, Anaheim, CA 92805, phone: (714) 491-1500, ext. 6394 or e-mail to extronews@extron.com.**

Christie Digital Systems, Inc.
www.christiedigital.com

Christie has recently introduced the **Roadster X9** and **Roadster S9**, a new line of three-chip DLP rental staging projectors. They each weigh 99 pounds and deliver 8500 ANSI lumens output. The Roadster X9 has a true XGA (1024 x 768) resolution, and the Roadster S9 has a true SXGA (1280 x 1024) resolution. Both can display images up to UXGA (1600 x 1200) resolution. The X9 offers a contrast ratio of 350:1 ANSI, and the S9 provides 400:1 ANSI or 800:1 full field while delivering superior video image reproduction. These Roadster models offer a number of inputs supporting various video and data formats and analog HDTV sources. The suggested USD list price is $64,995 plus lens for the Roadster X9 and $74,995 plus lens for the Roadster S9.

Recommended Extron products:
Extron **ISS Integration Seamless Switcher** allows eight additional inputs to be added to the Roadster projector. The ISS switcher also features two scaled signal outputs for "program" and "preview" simultaneously on BNCs and 15-pin HD connectors. The ISS provides truly seamless, glitch-free switching between eight inputs and delivers superior up/down scaling technology. The **ISS 108** supports 15 scaled output rates while the **ISS 408** accepts HDTV and supports 33 scaled output rates.

Roadster S9

Epson America, Inc.
www.epson.com

Epson has announced the EPSON **PowerLite 30c**, a portable LCD multimedia projector. It is positioned for SOHO professionals, K-12 educators, and home entertainment enthusiasts looking for an affordable projector with a quality image. The PowerLite 30c offers 800 ANSI lumens of brightness, a 400:1 contrast ratio, and a native SVGA (800 x 600) resolution. With Epson's exclusive SizeWise™ resizing technology, this projector is compatible with Mac or PCs that have up to XGA (1024 x 768) resolution. It is compatible with NTSC, PAL, SECAM, HDTV, component video, and RGB computer signals, and it offers a wide range of input options. The PowerLite 30c weighs 6.4 pounds and has a USD suggested list price of $1,299.

Recommended Extron products:
The Extron **MediaLink System** is a family of easy-to-use and inexpensive products that control A/V equipment in any small, one-projector environment. The MediaLink System streamlines operations and simplifies system control by integrating audio, video, and computer systems into one centralized, easy-to-use A/V system. The **MLC 206** MediaLink Controller acts as an extended remote control panel, and can be mounted on a wall, podium, or lectern. The **MLS 306** and **MLS 506** MediaLink Switchers consist of five different models that can be used with the MLC 206, or as standalone switchers.

PowerLite 30c

Fujitsu
www.plasmavision.com

Fujitsu has introduced the **PDS-5004**, a 50-inch High Definition wide screen (16:9) plasma display monitor. The PDS-5004 delivers 3000:1 contrast ratio and offers a native resolution of 1366 x 768 that can display the output from any digital and analog video source in full resolution, including the RGB output from a computer up to UXGA (1600 x 1200), true 1080i and 720p HDTV, and 480p signals from a DTV set-top box. It offers video inputs for component video, S-video, composite video, DVI-D, and RGB video connections, and it has a built-in stereo amplifier and stereo audio outputs for use in multimedia applications. The USD suggested retail price is $9,999.

Recommended Extron products:
For switching and distribution of HDTV, component, and S-video sources to the Fujitsu PDS-5004, Extron offers a selection of switchers and distribution amplifiers (DAs). For HDTV and component applications, Extron's **SW6 YUV A** switcher allows multiple HDTV images to be switched to one plasma display, and the Extron **DA6 YUV A** distribution amplifier allows one HDTV or component image to be distributed to up to six plasma displays. For S-video applications, the Extron **SW 6 SV** can be used to switch up to six S-video sources, and the Extron **SVDA 6 MX** can be used to distribute one S-video to six Fujitsu PDS-5004 plasma displays.

PDS-5004

NEC Solutions (America), Inc.
www.necvisualsystems.com

NEC has introduced the ShowCase Series **HT1000**, a DLP-based digital entertainment projector designed for residential and commercial entertainment users. The HT1000 has a native XGA (1024 x 768) resolution, and offers 1000 ANSI lumens of brightness and an industry first 3000:1 contrast ratio. This projector incorporates NEC's new proprietary SweetVision™ technology, which adds additional contrast enhancements. This projector has composite, S-video, component, RGB, and DVI inputs, and accepts all video formats including NTSC, PAL and SECAM. The HT1000 weighs 7.1 pounds and has a USD suggested list price of $5,495.

Recommended Extron product:
For home theater installations, the Extron **DVS 204** Digital Video Scaler offers an affordable switcher and scaler solution. Up to four video sources can be switched into the projector. Inputs one through four consist of an RGB input that works as a pass-through to simplify the system design, and they accommodate component video, S-video, and composite video. The output of the DVS 204 can then be scaled to the native 1024 x 768 resolution of the NEC Showcase HT1000 using proprietary Extron scaling technologies, including Dynamic Motion Interpolation, True Rate™, and Accu-RATE Frame Lock™.

HT1000

Samsung
www.samsung.com

Samsung has introduced the **PPM63H1**, a 63-inch wide screen (16:9) plasma display monitor perfect for conference rooms, retail displays and digital signage. The PPM63H1 delivers 600:1 contrast ratio and is currently the largest plasma display on the market. It features a high-resolution 1366 x 768 native resolution and accepts various computer signals, as well as NTSC, PAL, SECAM, HDTV, component, composite, and S-video signals. The suggested USD list price is $16,500.

Recommended Extron products:
For switching and distribution of HDTV/component and S-video sources to the Samsung PPM63H1, Extron offers a selection of twisted pair solutions that help system integrators maintain professional video quality over long cable runs while taking advantage of reduced cost, weight, size, and ease of cable termination. The Inline **VTT001CM** Transmitter and **VTR001CM** Receiver transmit and receive high-resolution RGBHV video signals up to 500 feet (152 meters) over CAT 5/5e/6 UTP cable. The Extron **TPX 88** and **TPX 88 A** Twisted Pair Matrix Switchers accept high-resolution signals ranging from RGBHV to S-video and stereo audio using twisted pair cable.

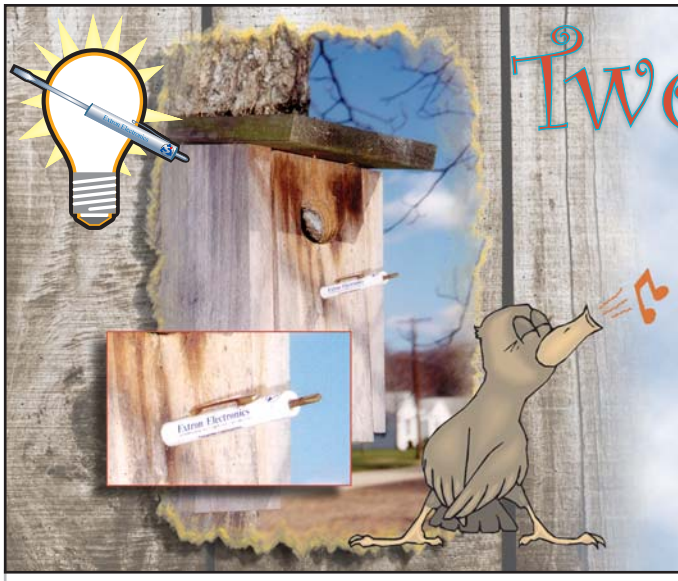
PPM63H1

Sharp Electronics Corporation
www.SharpLCD.com

Sharp has recently introduced two LCD projectors to its Notevision family: the **Notevision C45X** and **Notevision C45S**. These projectors are ideal for classrooms, conference rooms, and work environments. They deliver 2400 ANSI lumens and weigh 11.3 pounds. The Notevision C45X offers a native XGA (1024 x 768) resolution and the Notevision C45S offers a native SVGA (800 x 600) resolution. These projectors handle images up to UXGA 1600 x 1200 and various Macintosh and workstation signals, as well as NTSC, PAL, SECAM, and HDTV video signals. The suggested USD list price is $5,195 for the Notevision C45X and $4,395 for the Notevision C45S.

Recommended Extron product:
For fixed installations using the Notevision C45X or Notevision C45S, the Extron **System 7SC** Switcher offers more inputs, making it ideally suited for education and corporate environments. The System 7SC is a seven input, dual output switcher with scaling capabilities and advanced film mode processing: 3:2 pulldown detection for NTSC and 2:2 film detection for PAL. Six of the seven inputs of the System 7SC accept composite video, S-video, component (including HDTV), or RGBHV, while the seventh input accepts composite video, S-video, or RGBHV. Audio is available on all seven inputs with adjustable gain and attenuation.

Notevision C45X



Tweeker Use #66

Bird House Perch

When 15-year-old Katie Grillo came home from school with a handcrafted bird house, Katie and her father, Frank Grillo, agreed the avian sanctuary needed a perch. Frank, a senior design engineer at Telaid Industries in Niantic, Conn., had the perfect solution. "When I suggested an Extron Tweeker as a perch, Katie approved," says Frank.

Frank chose his Tweeker from a collection of 15, and to allow adequate nesting space inside, he removed part of the blade with a hacksaw. Once the perch was inserted and the bird house anchored in a tree outside the Grillo family's house, birds soon moved in and began "tweeking" with delight.

Thanks to all the following tweeker entries that were submitted for this issue.
The winning tweeker entry is...the **Bird House Perch**.

Ex-calibur,
by Doug Montcrieff

Lid Remover,
by Aimee James

Tweeker Flag,
by Dave Mueller

Computer Dismantler,
by Clinton Mowbray

Tums Scraper,
by Carl Maurer

Send us a photograph and brief explanation of how you use the Tweeker. If we publish it in a future issue of ExtroNews, we'll give you a **free VTG 150.** Please send entries along with contact information to:

Extron Tweeker Contest, 1230 South Lewis St., Anaheim, CA 92805.

Or e-mail a high-resolution photo and explanation to tweeker@extron.com

Extron Institute Upcoming Schedule, 2003

April 14-15	The Netherlands
April 19-20	Shanghai
April 24-25	Anaheim, CA
April 28-29	Cincinnati, OH
April 30 - May 1	Cincinnati, OH
May 12-13	The Netherlands
May 19-20	Singapore
June 16-17	The Netherlands
June 19-20	Anaheim, CA
June 24-25	Boston, MA
June 30	Bangkok
July 10-11	Anaheim, CA

Upcoming Tradeshows, 2002

April 7-10	New Product Showcase at the Venetian	Las Vegas, NV
April 16-18	InfoComm China	Shanghai
June 3-5	InfoComm	Orlando, FL

Extron® Electronics
1230 South Lewis Street
Anaheim, CA 92805

PRSRT STD
U.S.
POSTAGE
PAID W.M.S.

ExtroNews

ExtroNews is published by Extron Electronics/RGB Systems Inc. No portion of this newsletter may be reproduced in any form without written permission from Extron Electronics. Every effort has been made to ensure accuracy in content; however, Extron assumes no responsibility for errors and omissions in the information provided herein. ExtroNews is sent free of charge to communication industry professionals and end-users. Printed in the United States of America.

We welcome your comments and contributions! Please submit ideas to:

Extron Electronics, USA
1230 South Lewis Street
Anaheim, CA 92805
Phone: 714.491.1500 or 800.633.9876
Fax: 714.491.1517
E-mail: extronews@extron.com

Extron Electronics, Europe
Beeldschermweg, 6C 3821 AH Amersfoort
The Netherlands
Phone: +31.33.453.4040 or +800.3987.6673
Fax: +31.33.453.4050

Extron Electronics, Asia
135 Joo Seng Road #04-01
PM Industrial Building
Singapore 368363
Phone: +65.6383.4400
Fax: +65.6383.4664

Extron Electronics, Japan
Daisan DMJ Bldg. 6F, 3-9-1 Kudan Minami
Chiyoda-ku, Tokyo 102-0074
Japan
Phone: +81.3.3511.7655
Fax: +81.3.3511.7656